

HIPPELATES FLIES (DIPTERA: CHLOROPIDAE) POSSIBLY ASSOCIATED WITH BRAZILIAN PURPURIC FEVER

CELUTA H. PAGANELLI AND CURTIS W. SABROSKY

(CHP) Paganelli Consultoria Ambiental S/C Ltda., Rua Nazaré Paulista 163/114 E, 05448 São Paulo, SP, Brazil; (CWS) Cooperating Scientist, Systematic Entomology Laboratory, Agricultural Research Service, U.S. Department of Agriculture, Washington, D.C. 20560, U.S.A. Present address: 205 Medford Leas, Medford, New Jersey 08055, U.S.A.

Abstract.—Five new Brazilian species of *Hippelates* are described: *H. neoproboscideus*, *H. carrerai*, *H. parvicalcar*, *H. pseudodorsalis*, and *H. coxipo*. These and four species of *Liohippelates* are included in a key to possible vectors of an acute conjunctivitis that is a precursor of Brazilian Purpuric Fever.

Key Words: Taxonomy, Diptera, Chloropidae, *Hippelates*, *Liohippelates*, *Olcanabates*, eye gnats, Brazilian Purpuric Fever, *Haemophilus*, bacteria, conjunctivitis

In 1990–91 an outbreak of Brazilian Purpuric Fever (BPF) occurred in the states of Mato Grosso, Mato Grosso do Sul, and interior São Paulo. The fever, highly fatal to young children, was caused by a virulent invador clone of the bacterium *Haemophilus influenzae* biogroup *aegyptius* (Hae), which initially produced an acute conjunctivitis that was followed by a high fever and the characteristic pupura or rash, after which vital organs were attacked. In children 3 months to 9 years of age, as little as four hours would elapse from the time the pupura appeared until death ensued. For general information on this new disease (the first case was recorded in 1984), see Harrison et al. (1989) and Brazilian Purpuric Fever Study Group (1992).

The obvious presence of numerous eye gnats around the eyes and the association of these flies with conjunctivitis, as recorded in various parts of the Western Hemisphere, directed attention to them as potential vectors in the affected states of Brazil. Flies were collected by sweeping in places where BPF cases were registered and in other plac-

es without registered cases but treated as part of a case-control study. All chloropid genera already known to be attracted to and feeding on eye secretions were found during this study, i.e. *Hippelates* and *Liohippelates* in abundance, *Siphunculina* rarely. The following species were present in collections from Mato Grosso: Five new species of *Hippelates* herein described, *Liohippelates currani* (Aldrich), *L. flavipes* (Loew), *L. peruanus* (Becker), *L. sp. (pusio complex)*, and *Siphunculina striolata* (Wiedemann). Among these, *L. currani* and *L. peruanus* were most common in urban areas, and *Hippelates neoproboscideus*, n. sp., most frequent in rural areas. In the northwest of São Paulo State, only *L. flavipes*, *L. peruanus*, and *H. parvicalcar*, n. sp., were collected.

These gnats, all previously classified in the genus *Hippelates*, are characteristically attracted to animal fluids, whether from various body openings, sores, or wounds. 'Eye gnats' is a commonly used term, but not all species of the group are attracted to the eyes, e.g. yaws flies feed at sores on the lower limbs.

Knowing that some of these gnats are not attracted to eyes, some collections were made by aspirator around children's eyes in order to determine which species occurred there. These would be likely vectors of conjunctivitis and BPF in Brazil. In those eye collections, only *L. currani*, *L. peruanus*, and two new species, *H. neoproboscideus* and *H. parvicar*, were present. The BPF clone was also isolated from a macerate of *L. peruanus* and *H. neoproboscideus* collected from children's eyes in Mato Grosso (Tondella et al. 1991), which further shows that at least one or both species are possible vectors of this disease.

Five new species of the genus *Hippelates* Loew were found, some in abundance, and these are described here so that they may be properly recorded in subsequent reports on the study of the disease. The key includes these and four species of *Liohippелates* Duda, three of which were numerous in the collections made during surveys for possible vectors of *Haemophilus*. There are no reliable published keys to the Neotropical species of either genus of flies, and the present study is part of our on-going revision of the species of the group for the entire Western Hemisphere. The nearly 60 known species were catalogued by Sabrosky and Paganelli (1984), including four then recognized in *Olcanabates* Enderlein (see remarks under *H. parvicar*, n. sp.).

The terminology follows that of McAlpine (1981) in the *Manual of Nearctic Diptera*, except that we follow traditional usage in acalyprate Diptera: 3rd antennal segment instead of first flagellomere, humeral callus instead of postpronotum, and mesopleuron and sternopleuron instead of anepisternum and katepisternum; also microtomentose instead of pruinose.

The following characteristics are present in all the new species of *Hippelates* described in this paper: Epandrium well developed, compared to the small size of the hypandrium which is small, narrow and completely closed; cerci distinctly separated

from each other, well developed, in some species very long with a few setae; surstyli with many long internal setae (cf. Fig. 10a); gonopods (pregonites) fused with the phallopodic sclerite; parameres (postgonites) convergent, with a few setae; basiphallus cylindrical, elongate; distiphallus long, membranous.

For brevity in listing localities, we have used the present standard abbreviations for the Brazilian states, as follows:

- MG Minas Gerais
- MT Mato Grosso
- PA Pará
- PE Pernambuco
- PR Paraná
- RJ Rio de Janeiro
- SC Santa Catarina
- SP São Paulo

The notation (BPF Group) on labeled specimens refers to about six collectors in various combinations at different times and places.

Holotypes, allotypes, and paratypes of the new species will be deposited in the Museu de Zoologia, Universidade de São Paulo. Paratypes when available will be deposited in the natural history museums in Washington, D.C.; London, England; Ottawa, Canada; San Francisco, California; and Berlin, Germany.

KEY TO SPECIES OF *HIPPELATES*
AND *LIOHIPPELATES* POSSIBLY
ASSOCIATED WITH BRAZILIAN
PURPURIC FEVER

- 1. Frontal triangle and dorsum of thorax dull, densely gray microtomentose, the triangle in some species with glossy black spots (*Hippelates*) 2
- Frontal triangle and dorsum of thorax highly shining, smooth and glossy black except as interrupted by punctures (*Liohippелates*) 6
- 2. Thorax entirely black in ground color; frontal triangle with three glossy black spots, the median usually large and long, occasionally narrow 3
- Thorax chiefly black in ground color, but humeral calli and scutellum entirely or partly red-

- dish yellow; frontal triangle gray, at most with tiny glossy area by each ocellus 4
- 3. Spur on hind tibia only slightly preapical, and its apex at $\frac{3}{4}$ length of first tarsomere (Fig. 1) 1. *H. neoproboscideus*, n. sp.
- Spur on hind tibia decidedly preapical, strongly curved and at or little beyond half length of first tarsomere (Fig. 2) 2. *H. carrerai*, n. sp.
- 4. Spur on hind tibia long, length greater than widest diameter of tibia 5
- Spur on hind tibia short, about equal in length to diameter of tibia (Fig. 3) 3. *H. parvicar*, n. sp.
- 5. Hind femur and tibia yellow 4. *H. pseudodorsalis*, n. sp.
- Hind femur and tibia each infuscate mesally, dark area on hind tibia especially distinct 5. *H. coxipo*, n. sp.
- 6. Legs predominantly yellow 7
- Legs predominantly black, including all coxae, all femora except knees narrowly, and hind tibia except narrowly at each end 6. *L. sp. (pusio complex)*
- 7. Apex of hind tibia excised and angulate (Fig. 4); hind tibia black to apex, narrowly yellowish at base 7. *L. tibialis* Duda
- Hind tibia distally not angulate, the tibia yellowish at both ends (Figs. 5, 6) 8
- 8. Prosternum black; frontal triangle ending well before anterior margin, black, usually appearing equilateral with straight sides because its narrow acute apex is yellowish and inconspicuous; spur on hind tibia moderately stout, gently curved, slightly longer than tibial diameter opposite base of spur (Fig. 5) 8. *L. currani* (Aldrich)
- Prosternum yellow; frontal triangle appearing longer and narrower than in *currani* because attenuated to apex and sides somewhat concave, the triangle often reddish laterally, especially in males; spur on hind tibia almost straight, short, subequal to diameter of tibia opposite base of spur (Fig. 6) 9. *L. peruanus* (Becker)

1. *Hippelates neoproboscideus*, N. Sp.

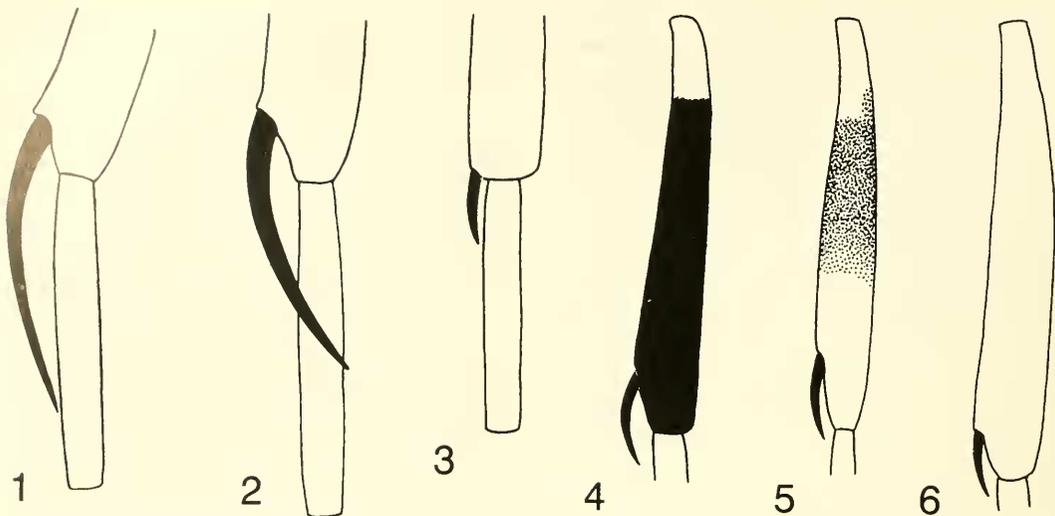
Diagnosis.—Densely gray microtomentose, including most of lower half of pleuron; frontal triangle with three glossy black spots; spur on hind tibia long, gently curved, only slightly preapical.

Male, female.—*Color*: Head with occiput and frontal triangle black, the latter dull, densely gray microtomentose except for three glossy black spots, one laterad of each

posterior ocellus and one between median ocellus and apex of triangle, this median area varying from a parallel-sided stripe to a large oval or almost circular spot; frons bright yellowish, slightly infuscate in posterior corners toward base of triangle; narrow parafrontal, face, cheek and palpus whitish; antenna whitish yellow in male, 3rd segment orange yellow in female, brownish on anterodorsal $\frac{1}{3}$ to $\frac{1}{2}$. Thorax entirely black in ground color except for yellow prosternum, densely gray microtomentose except for glossy black propleuron, posterior slope of sternopleuron, and mediotergite of postnotum; all bristles black. Abdomen with tergites 1–2 yellow, 3–5 dark brown, in females typically all brown except apex of 5, occasionally narrowly yellow on hind margins, in males more yellow on hind margins, often like 3 connected spots on each tergite, rarely chiefly yellow with median and lateral spots weakly or not at all connected; male genitalia yellow. Legs bright yellow with weak median brown band on hind tibia; spur on hind tibia black. Wing clear, veins yellow; halter yellow.

Head: Frons parallel-sided, 1.2–1.4 times longer than broad, width at vertex about 1.5 times width of an eye as viewed from above; frontal triangle equilateral, apex at middle of frons, with row of short interfrontal setulae on each extreme side; cheek of moderate width, its height $\frac{3}{4}$ breadth of 3rd antennal segment and $\frac{1}{4}$ eye height, vibrissal angle 90 degrees; each section of slender and geniculate proboscis as long as lower margin of head; 3rd antennal segment approximately orbicular; arista micropubescent.

Thorax: Median acrostichal and dorso-central lines slightly impressed, distinct, and with numerous setulae in fine punctures, 2 rows intermediate between the median acrostichal and each dorso-central row; spur on hind tibia long and gently curved, inserted slightly preapical, with $\frac{2}{3}$ of its length beyond apex of tibia, the tibia slightly excised (Fig. 1). Wing with 2nd costal section long, twice 3rd section.



Figs. 1-6. 1-3, apex of hind tibia, spur, and first tarsomere of *Hippelates* species: *neoproboscideus* (1), *carrerai* (2), *parvicar* (3). 4-6, hind tibia and spur of *Liohippелates* species: *tibialis* (4), *currani* (5), *peruanus* (6).

Male genitalia (Fig. 7): Cerci elongate, each less than half length of a surstylus. Surstyli subconical, with many long setae internally (as in Fig. 10a).

Length: 1.25-1.5 mm.

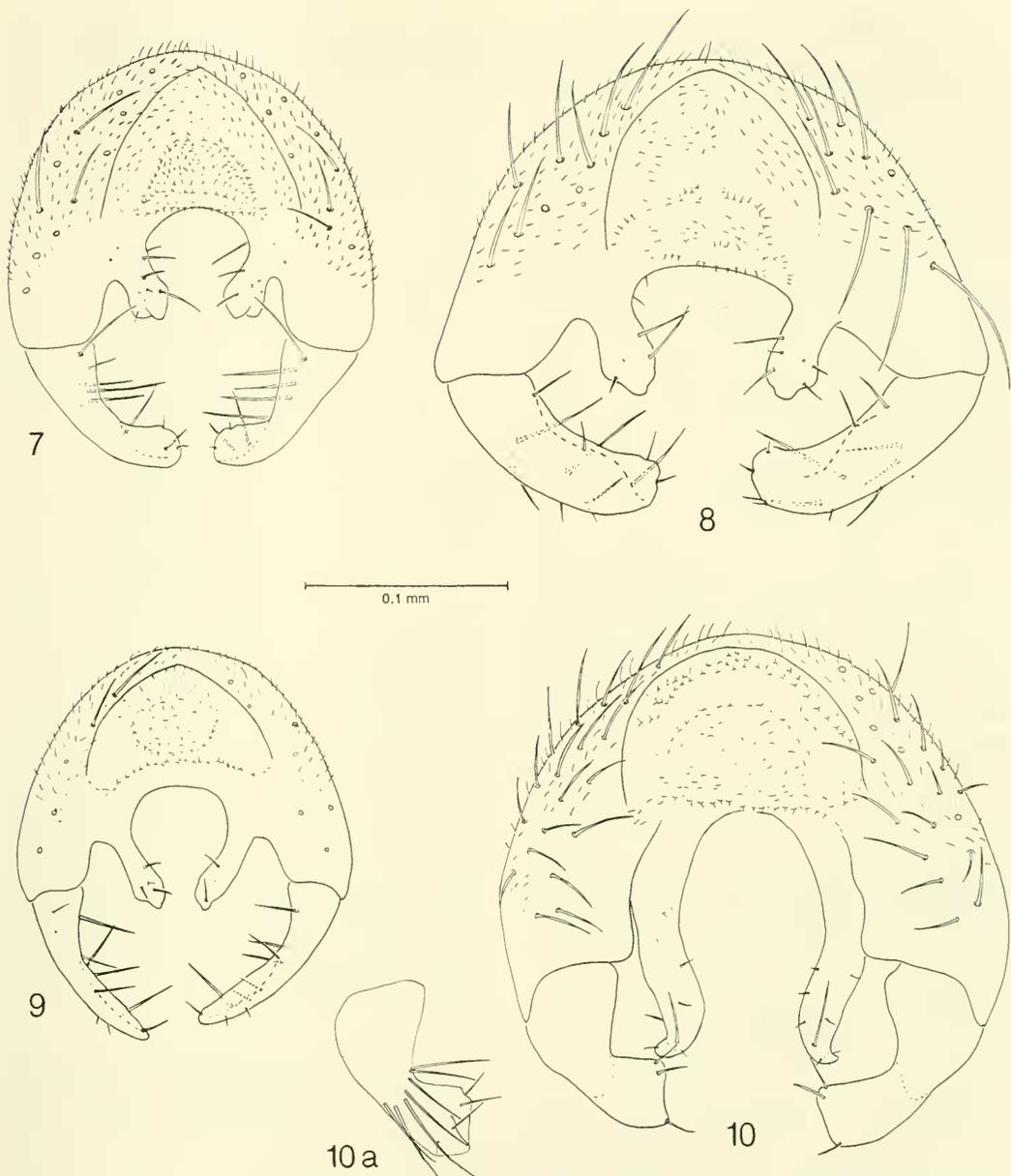
Holotype male and allotype.—**Brazil, MT**: Coxipó do Ouro, 17.xi.1990 (Paganelli). *Paratypes, Brazil, MT* except as noted: 9 males, 32 females, same data as holotype; 4 females, Cuiabá, 7.iii.1990 and 2 males, 5 females, Cuiabá, iii.1990 (BPF Group); 71 males, 8 females, Cuiabá, São Gerônimo, 4.iv.1990 (BPF Group); 17 males, 20 females, Cuiabá, São Gerônimo, 17.ii (4-0), 10.v (3-19), and 12.v (10-1), 1990 (BPF Group); 3 females, Poconé, 15.xi. and 17.xi. (two) 1990 (Paganelli); male, Várzea Grande, Vila Artur, Jardim Glória, 18.xi.1990 (Paganelli); female, Fazenda Canaa, Três Lagoas, x.1966 (F. Lane); **SC**: 2 females, Nova Teutônia, 300-500 m, 11.i.71 and 1.x.71 (Fritz Plaumann); **SP**: 6 females, Guatapará, i.1945 (M. Carrera); **SP**: female, Itirapina, Cerrado, 6.iv.1991 (A. L. Serra).

In all, over 600 specimens were examined but many were not in good enough condition for inclusion in the type series. Most

localities in the type series were duplicated, except as follows: **MT**: Nova Mutum and Várzea Grande, Mapim; **RJ**: Nova Friburgo.

Etymology.—From its similarity to *H. proboscideus* (Williston).

This species resembles *H. proboscideus* (Williston) of the Caribbean region and has been so identified in the past, until we realized that the glossy black lower pleuron characterizes typical *proboscideus* and the chiefly gray microtomentose lower pleuron characterizes the present geographically distinct species. The male genitalia of *H. proboscideus* also differ from those of *H. neoproboscideus* in darker color, epandrium wider than long in posterior view, surstyli long and curved, and each cercus longer than half length of a surstylus. There are several other Neotropical species in what might be termed the “*proboscideus* group,” and in all of them the range in the shape and extent of the glossy black spots on the frontal triangle were puzzling when available material was limited. The exceptionally long series resulting from the attention given to possible vectors of Brazilian Purpuric Fever was



Figs. 7-10. Epandrium, cerci and surstyli of *Hippelates* species: *neoprobovideus* (7), *carrerai* (8), *parvicar* (9) and *coxipo* (10, 10a). Fig. 10a, inner view of right surstylus.

a welcome addition to the study of *Hippelates*.

2. *Hippelates carrerai*, N. Sp.

Diagnosis.—Frontal triangle gray with three large glossy black spots; thorax gray

microtomentose, with propleural area shining reddish yellow; leg predominantly yellow; spur on hind tibia decidedly preapical.

Male, female.—*Color:* Head chiefly yellow, entire occiput and frontal triangle black in ground color, the latter densely gray mi-

crotomentose with 3 large glossy black spots, the anterior somewhat oval; frons yellow, brown in posterior corners beside triangle; 3rd antennal segment infusate anterodorsally, less so in male than in female. Thorax black in ground color, densely brownish gray microtomentose except for shining reddish yellow propleuron and anterior spiracle, some glossy black areas on lower half of pleuron, and glossy black mediotergite of postnotum; knob of halter whitish yellow, stalk yellow. Abdomen chiefly brown, finely brownish microtomentose; male genitalia blackish. Legs chiefly yellow; hind femur somewhat infusate mesally, hind tibia with brown band on mesal third, and all tarsi infusate; spur on hind tibia black.

Head: Frons broad, at vertex 1.4 times width of an eye as seen from above, and 1.1 times its length; frontal triangle large, barely broader at base than its length, apex almost at middle of frons; cheek of moderate width, 0.70 times breadth of 3rd antennal segment and $\frac{1}{2}$ eye height. *Thorax:* Mesoscutum distinctly punctured, the intermediate acrostichal hairs in 1–2 rows on each side of median row, typically one row at least anteriorly. Spur on hind tibia preapical by a bit less than half its length, strongly curved, the tibia excised distally (Fig. 2). *Wing:* 2nd costal section longer than usual, twice 3rd section.

Male genitalia (Fig. 8): Cerci as in *neoproboscidea*. Surstyli large, flattened and curved.

Length: 1.5–1.75 mm.

Holotype male.—**Brazil, MG:** Ouro Preto, 18.vii.1970 (F. Val). Allotype, **MG:** Cachoeira do Brumado, vii.1970 (F. Val). Paratypes.—2 males, same data as holotype; **PR:** 3 females, Rio Negro, one of 18.i.1924 (erroneously labeled *Cotypus* of “*Siphonella proboscidea* Duda”), and two of i.1929; **RJ:** 4 females, Alto da Mosela, Petrópolis, 1200 m. 6.ii. (two), 9.ii., and 15.ii.1971 (D. O. Albuquerque); **RJ:** female, Itatiaia, 14.viii.1971 (H. F. Berla); **SP:** male, São Paulo, 7.ii.1977 (Alin).

Specimens not paratypes.—One, abdo-

men missing, same data as holotype; headless male, **RJ:** Petrópolis, 2.12.1922 (Borgmeier) (also erroneously labeled *Cotypus* of *S. proboscidea*).

Duda's identification label of “*S. proboscidea*” was misinterpreted by someone as *Siphonella proboscidea* Duda, rather than *Siphomyia proboscidea* Williston. The so called cotypes have no standing.

A male and five females resemble *carrerae* except in having the propleuron and area around the anterior spiracle glossy black. For the present they have been left as a variety of *carrerae*: **MT:** Nossa Senhora do Livramento and Cuiabá; **RJ:** Alto da Mosela, Petrópolis, 1200 m; **SP:** Araçoiaba.

Etymology.—The species *H. carrerae* is dedicated with respect and affection to our friend of many years, Dr. Messias Carrera, who has contributed greatly to the study of Diptera in Brazil and who collected many earlier specimens of these gnats.

This species, or at least a variety of it, was a very minor factor in the BPF Survey, but it is included here for completeness.

Realization of the significance of the microtomentose lower pleuron has separated a group of undescribed species. Among those with three glossy black spots on the frontal triangle, the preapical spur and predominantly yellow legs stand out as recognition features for *carrerae*.

3. *Hippelates parvicar*, N. Sp.

Diagnosis.—Small, thorax partly reddish yellow, spur on hind tibia very short, almost bristlelike.

Male, female.—*Color:* Head chiefly yellow, occiput except extreme edges and the frontal triangle black, latter densely gray microtomentose without glossy spots; cheek whitish yellow; antenna yellow, arista and 3rd segment anterodorsally infusate. Thorax chiefly yellow, including humeral calli and scutellum, the mesoscutum black except laterally, densely gray microtomentose; some scattered infusate areas on pleuron; mediotergite of postnotum glossy black.

Abdomen with tergites chiefly brown to brown-black, tergites 2–4 with yellow hind margins. All legs yellow except for infuscate distal tarsomeres.

Frons broad, parallel-sided or narrowed slightly anteriorly, width at vertex 1.8 times width of an eye as viewed from above and 0.92 times its length, the frontal triangle short, less than half way to anterior margin of frons, and broader at base than long (1.70×); cheek moderately broad, its height about equal to breadth of 3rd antennal segment and nearly 0.30 times the eye height; proboscis slender and geniculate but not as long as in the other species. Mesoscutum with short hairs set in fine and inconspicuous punctures; two rows of intermediate acrostichals on each side of midline. Spur on hind tibia (Fig. 3) very short, subequal diameter of tibia at base of spur, slightly preapical; tibia not excised. Wing with 2nd section moderately long, 1.7 times 3rd section.

Male genitalia (Fig. 9): Cerci elongate, each half as long as a surstylus. Surstyli convex, flattened, platelike, not narrowed at tips, almost as long as height of epandrium.

Length: 1.25 mm.

Holotype male and allotype. — **Brazil, SP**: Valparaíso, Bairro Santa Casa, 25.x.1990, "aspirador" (Paganelli). Paratypes. — **Brazil, SP**: 10 females, including three, Araçoiaba da Serra, 26.iv.1981 (Paganelli), four (also 1 male), Bebedouro, 17.xii.1990 (Paganelli), and one each, Coxipó do Ouro, 17.xi.1990 (Paganelli), Nova Europa, Crêche Municipal, 26.i.1991 (G. A. Silva), and Valparaíso, Usina, UNIVALEM, 25.x.1990 (Paganelli); **MT**: 7 males, 7 females, including female, Cuiabá, 7.iii.1990 (BPF Group), 5 males, 3 females, Cuiabá, São Gerônimo, 4.iv. (4-0), 10.v. (0-2), and 12.v. (1-1) 1990 (BPF Group), female, Nossa Senhora do Livramento, 2.i.1991 (BPF Group), female, Nova Mutum, 19.ii.1990 (BPF Group), male, Poconé, Centro, 16.v.1990 (BPF Group), female, Poconé, 17.xi.1990, bait (Paganelli), male, Várzea Grande, Vila Artur, Jardim Glória, 18.xi.1990 (Paganelli).

Also **Bolivia, Santa Cruz**: 2 females, Ichilo-Yapacaní, 11.ii.1971 (L. E. Peña).

Not paratypes. — 11 males, 20 females, of the same localities, plus **MT**: Santo Antônio do Leverger, and **PE**: Fazenda Amapá Agrestina.

Etymology. — The specific name is a noun compounded from the Latin adjective *parvus*, small, and noun *calcar*, spur.

This is the only species of *Hippelates* with a very short spur that was taken in the survey. It belongs to a group of species that was at one time considered a separate genus, *Olcanabates* Enderlein, but the species appear to us to be *Hippelates* with very reduced spur. They are eye gnats and the male genitalia agree with those of *Hippelates*.

4. *Hippelates pseudodorsalis*, N. Sp.

Diagnosis. — Densely gray-microtomentose frontal triangle and thorax, the humeral calli, scutellum (except at base), and pleuron in part reddish yellow; legs entirely yellow; spur on hind tibia preapical, stout, curved, the tibia distally excised.

Male, female. — *Color*: Head chiefly yellow, the frontal triangle chiefly blackish centrally, occiput broadly black across middle from eye to eye, yellow above and below; 3rd antennal segment infuscate anterodorsally. Dorsum of thorax chiefly black, with humeral calli, notopleura and scutellum (except at base) reddish yellow; mesoscutum densely gray microtomentose; mediotergite of postnotum glossy black; pleuron reddish yellow anteriorly and above, the sternopleuron, except sometimes a weak reddening along posterodorsal margin, and adjacent anteroventral area of mesopleuron black, almost entirely gray microtomentose. Abdomen yellow toward base, tergites 3–5 with broad infuscate bands anteriorly, posteriorly yellow, the yellow bands wider in males than in females; male genitalia shining yellow. Legs entirely yellow, only spur on hind tibia glossy black. Wing clear, veins brownish.

Frons of moderate width, at vertex 1.4

times width of eye as viewed from above, and over $\frac{3}{4}$ its own length; frontal triangle approximately equilateral, apex midway of frons, sometimes with traces of tiny glossy black spots beside each ocellus; cheek not broad, subequal to breadth of 3rd antennal segment and over $\frac{1}{4}$ eye height; proboscis slender and geniculate, exceptionally long, each section longer than length of lower margin of head, projecting in advance of head as seen in profile. Mesoscutum with numerous hairs set in fine punctures, typically 2–3 somewhat irregular rows of intermediate acrostichals on each side of median row. Spur on hind tibia stout, strongly curved, preapical, about equal to tibial diameter, inserted half its length before apex of tibia, the tibia excised and angulate. Wing with 2nd costal section only 1.7 times 3rd section.

Male genitalia: Very similar to *H. coxipo* (cf. Fig. 10). Cerci very long and curved, more slender than in *coxipo*. Surstyli longer and curved.

Length: 2–2.5 mm.

Holotype male and allotype. — **Brazil, RJ:** Saquarema, 5.xii.1982 (Paganelli). Paratypes. — All **Brazil**, 6 males, 27 females, same data as holotype; **MT:** 2 males, 3 females, Cuiabá, São Gerônimo, 10.v. (2-2) and 12.v.1990 (BPF Group); **MT:** 2 males, Nossa Senhora do Livramento, 2.i.1991 (BPF Group); **RJ:** male, Grajaú (H. S. Lopes); **RJ:** female, Taquara, Petrópolis, 15.ii.1971 (H. S. Lopes); **SP:** male, 16 females, Araçoiaba, 26.iv.1981, bait (Paganelli); **SP:** 10 females, Guatapará, i.1945 (M. Carrera); **SP:** female, São Paulo, iv. 1960 (Forattini).

Not paratypes. — 2 males, 43 females, **SP:** Guatapará.

Etymology. — The species is very suggestive of the Caribbean *H. dorsalis* Loew, hence the name *pseudodorsalis*.

The yellow legs and stout preapical spur on the hind tibia resemble those of *H. dorsalis* Loew, but *dorsalis* is a much paler species with more restricted black coloration. The extent of black areas on the frontal tri-

angle and mesopleuron in *pseudodorsalis* varies, possibly depending on the degree of maturity of the specimens.

5. *Hippelates coxipo*, N. Sp.

Diagnosis. — Densely gray-microtomentose frontal triangle and thorax, the humeral calli, scutellum (except disk in part), and propleuron reddish yellow; legs predominantly yellow; hind femur and hind tibia strongly infusate mesally; spur on hind tibia stout, preapical, the tibia excised.

Male, female. — *Color:* Head predominantly yellow, occiput chiefly and frontal triangle black, densely dark gray microtomentose; frons dark yellow, contrasting with narrow whitish yellow parafrontals, parafacials and cheeks; 3rd antennal segment dorsally infusate. Thorax predominantly black in ground color, the humeral calli, scutellum except much of disk, and propleural area reddish yellow; mesopleuron often partly reddish yellow dorsally, narrowly glossy black anteroventrally; sternopleuron partly gray microtomentose, partly glossy black especially ventrally; mediotergite of postnotum glossy black. Abdomen yellow toward base, tergites 3–5 broadly yellow on hind margins in male, in female entirely brown or occasionally with linear traces of yellow, and tergite 5 yellow distally in female. Fore and mid legs yellow; hind femur and hind tibia strongly infusate mesally, that on tibia a definite band; spur on hind tibia glossy black. Wing veins yellowish to brown; halter knob whitish yellow, stalk yellow.

Frons moderately broad, at vertex 1.5–1.6 times width of eye as viewed from above, and $\frac{3}{4}$ its own length; frontal triangle approximately equilateral, apex about at middle of frons, usually with tiny glossy black area beside each ocellus; cheek similar to that of *pseudodorsalis*, not broad, 0.70 times breadth of 3rd antennal segment and 0.20–0.30 times height of eye; proboscis as described for *pseudodorsalis*, each section longer than length of lower margin of head.

Dorsum of thorax with numerous short and inconspicuous hairs set in fine punctures, 2–3 somewhat irregular rows of intermediate acrostichals on each side of median row. Spur on hind tibia stout, strongly curved and preapical, inserted half its length before apex of tibia; tibia excised and distally angulate. Wing with 2nd costal section slightly over 1.5 times 3rd section.

Male genitalia (Fig. 10, 10a): Cerci very long and curved, each longer than a surstylus, and with slightly curved tips. Surstyli slightly convex, short and blunt, with a row of long internal setae mesally (Fig. 10a).

Length: 1.75 mm.

Holotype and allotype.—**Brazil, MT**: Coxipó do Ouro, 17.xi.1990 (Paganelli). Paratypes (all **Brazil**): **MT**: 7 males, 2 females, same data as holotype; **MT**: 2 males, 1 female, Cuiabá, Bela Vista, 17.xi.1990 (Paganelli); **MT**: male, Cuiabá, São Gerônimo, 4.iv.1990 (BPF Group); **PE**: 5 males, 19 females, Fazenda Amapá, Agrestina, 11–17.vi.1971 [Expedição do Museu de Zoologia]; **RJ**: 2 males, 1 female, Saquarema, 5.xii.1982 (Paganelli); **RJ**: 4 females, Manginhos, 18.i.1971 (S. Pacheco); **SP**: Cotia, 1986 (Paganelli); **SP**: 2 females, Balneário Flórida, Praia Grande, 7–8.ii.1981 (Paganelli); **SP**: male, 3 females, Guatapará, i.1945 (M. Carrera).

Not paratypes.—4 males, 22 females of the preceding localities, plus **SP**: Praia de Juquehy, Município São Sebastião, 29.x.1972 (F. C. Val).

Etymology.—The specific name is a noun in apposition, from the name of the type locality, one of the localities of cases of Brazilian Purpuric Fever.

Most specimens show the distinct male-female difference in the color pattern of the abdomen, but two specimens, not paratypes, are exceptions. A male of the Pernambuco series has a female-patterned abdomen, and a female from Praia de Juquehy in the state of São Paulo has the abdominal pattern of a male.

The stout preapical spur on the hind tibia

and the gray-microtomentose frontal triangle will distinguish *H. coxipo* from other new species in the group with partly reddish yellow thorax, and in addition the infuscation on hind femur and hind tibia will distinguish it from the already described *H. dorsalis* Loew.

ACKNOWLEDGMENTS

We extend our gratitude to the Instituto Adolfo Lutz in the person of their directors, Dr. Anísio de Moura (General Director), José Eduardo Tolezano (Division of Medical Biology), Dr. Vera Simonsen Dias Vieira (Dept. of Bacteriology), Luiza T. M. de Souza (Dept. of Virology), and many of their staff members, for providing working space, facilities, and assistance during the development of this research; to Dr. Paulo E. Vanzolini and Dr. Francisca C. do Val, Museu de Zoologia da Universidade de São Paulo, for the loan of specimens and for providing a technician to mount part of the specimens collected; and to Mrs. Linda Lawrence, Systematic Entomology Laboratory, U.S. Department of Agriculture, for inking and arranging the drawings. The senior author is also indebted to Dr. Wagner A. Costa and Dr. Graziela A. Silva, Centro de Vigilância Epidemiológica da Secretaria da Saúde de São Paulo, for providing funds for the identification period (Proc. 233/91 – FESIMA); to Dr. Claire V. Broome and Bradley A. Perkins, M.D., Centers for Disease Control, Atlanta, Georgia, for supporting one of the trips to Mato Grosso, and contributing in many ways; and to Dr. Ione M. Bortolotto (Divisão de Vigilância, Secretaria da Saúde de Mato Grosso) and Dr. Olga A. Takano (Fundação Universidade Federal de Mato Grosso) for their help and facilities during the field work in Mato Grosso; and to Dr. Sergio A. Vanin, Dept. Zoology, Instituto de Biociências, Universidade de São Paulo, for permission to prepare the drawings of male genitalia under his microscopes with camera lucida.

LITERATURE CITED

- Brazilian Purpuric Fever Study Group. 1992. Brazilian Purpuric Fever identified in a new region of Brazil (report prepared by Bradley A. Perkins and Claire V. Broome). *Journal of Infectious Diseases* 165(Suppl. 1): 516-519.
- Harrison, L. H., et al. 1989. Epidemiology and clinical spectrum of Brazilian Purpuric Fever. *Journal of Clinical Microbiology* 27: 599-604.
- McAlpine, J. F. 1981. Morphology and terminology—Adults, pp. 9-63. In McAlpine, J. F., et al., eds., *Manual of Nearctic Diptera*, Volume 1. Ottawa, Research Branch, Agriculture Canada, Monograph 27: 674 pp.
- Sabrosky, C. W. and C. H. Paganelli. 1984. 81 Family Chloropidae, 63 pp. In *A Catalogue of the Diptera of the Americas South of the United States*. Museu de Zoologia, Universidade de São Paulo.
- Tondella, M. L. C., et al. 1991. Isolamento do clone invasor de *Haemophilus aegyptius* (Hae), responsável pela Febre Purpúrica Brasileira (FPB), de chloropídeos (Diptera) dos gêneros *Hippelates* e *Liohippелates*. *Revista Brasileira de Microbiologia* 22(3)(Suppl. 1): 157. (In Resumos do XVI Congresso Brasileiro de Microbiologia e IX Simpósio Nacional de Fermentações.)